

SEQUENCE LISTING

<110> Fraser, Clair  
Galeotti, Cesira  
Grandi, Guido  
Hickey, Erin  
Mesignani, Vega  
Mora, Marirosa  
Peterson, Jeremy  
Pizza, Marigrazia  
Rappuoli, Rino  
Ratti, Giulio  
Scarlotto, Vincenzo  
Scarselli, Maria  
Tettelin, Herve  
Venter, Craig

<120> Neisseria Meningitidis Antigens and Compositions

<130> CHIR0334

<140> 09/674,546

<141> 1999-04-30 (International Filing Date)

<160> 3264

<170> PatentIn Ver. 2.1

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35 40 45

Trp Ala Ile Leu Pro Arg Ser Leu Arg Ser Lys Ser Thr Ile Ile Thr  
50 55 60

Phe Ser Ala Arg Phe Phe Gly Ser Val Cys Asn Ser Ala Ala Arg Arg  
65 70 75 80

Ser Ser Cys Pro Ser Pro Lys Ile Gly Ala Val Pro Phe Ile Gly Ser  
85 90 95

Val Leu Met Val Pro Ser Glu Ala Met Leu Arg Lys Ser Ser Gly Glu  
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Asn Thr Ala  
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Pro Lys Arg Asp Thr Leu Asn Gly Ser Gly Thr His Thr Val Pro Val  
35 40 45

Trp Ala Ile Leu Pro Arg Ser Leu Arg Ser Lys Ser Thr Ile Ile Thr  
50 55 60

Phe Ser Ala Arg Phe Phe Gly Ser Ala Cys Asn Ser Ala Ala Arg Arg  
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Ser Ser Cys Pro Ser Pro Lys Ile Gly Ala Val Pro Phe Ile Gly Ser  
85 90 95

Val Leu Met Val Pro Ser Glu Pro Ile Leu Arg Lys Ser Ser Gly Glu  
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Lys Thr Ala  
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Pro Lys Arg Asp Thr Leu Asn Gly Ser Gly Thr His Thr Val Pro Val  
35 40 45

Trp Ala Ile Leu Pro Arg Ser Leu Arg Ser Lys Ser Thr Ile Ile Thr  
50 55 60

Phe Ser Ala Arg Phe Phe Gly Ser Ala Cys Asn Ser Ala Ala Arg Arg

65                    70                    75                    80

Ser Ser Cys Pro Ser Pro Lys Ile Gly Ala Val Pro Phe Ile Gly Ser  
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Lys Thr Ala  
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Arg Phe Phe Ile Arg Cys Arg Val Glu Ala Phe Ala Leu Arg Cys Gly  
35 40 45

Phe Gly Phe Ala Arg Gln Arg Phe Val Gly Phe Ala Asp Val Asp Val  
 50 55 60

Ala Val Ala Val Gly Val Phe Asn Gln Val Val Leu Met Val Phe Leu  
 65 70 75 80  
 Gly Val Val Glu Val Phe Gln Arg Phe Val Phe Asn Asn Glu Gly Gln  
 85 90 95  
 Leu Val Phe Leu Leu Ala Phe Glu Gly Gly Asp Asp Gly Phe  
 100 105 110  
 Phe Gly Gly Val Gly Val Val His Ala Ala Ala Val Leu Arg Ala Gly  
 115 120 125  
 Val Val Thr Leu Phe Val Glu Ala Gly Arg Ile Asn Asp Ala Glu Ile  
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 145 150 155 160  
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 165 170 175  
 Arg Val Phe Arg Val Ala Val Gly Val Thr Gly Tyr Arg Val Asn His  
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Arg Phe Phe Ile Arg Cys Arg Val Glu Ala Phe Ala Leu Arg Gly Gly  
35 40 45

Leu Gly Phe Ala Arg Gln Arg Phe Val Ser Xaa Ala Asp Val Asp Val  
50 55 60

Ala Val Ala Val Gly Val Phe Asn Gln Val Val Leu Met Val Phe Leu  
65 70 75 80

Gly Ile Val Glu Val Phe Gln Arg Leu Val Phe Asn Asn Glu Gly Gln  
85 90 95

Leu Val Phe Leu Leu Ala Phe Glu Gly Xaa Gly Asp Asp Gly Phe  
100 105 110

Phe Xaa Gly Val Gly Val Val His Ala Ala Ala Val Leu Arg Thr Gly  
115 120 125

Val Val Ala Leu Phe Val Glu Ala Gly Arg Ile Asn Asp Ala Glu Glu  
130 135 140

Ile Leu Gln Asp Val Val Ala Glu Phe Val Gly Ile Val Gly His Phe  
145 150 155 160

Asp Gly Phe Gly Val Ala Arg Met Ala Val Gly His Val Phe Ile Ala  
165 170 175

Arg Ile Phe Arg Val Ala Val Gly Val Ala Gly Tyr Arg Val Asn His  
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<212> DNA

<213> Neisseria meningitidis

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<212> PRT

<213> Neisseria meningitidis

<400> 12

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Arg Phe Phe Ile Arg Cys Arg Val Glu Ala Phe Ala Leu Arg Cys Gly  
35 40 45

Leu Gly Phe Ala Arg Gln Arg Phe Val Gly Phe Ala Asp Ile Asp Val  
50 55 60

Ala Val Ala Val Gly Val Phe Asn Gln Val Val Leu Met Val Phe Leu  
65 70 75 80

Gly Ile Val Glu Val Phe Gln Arg Leu Val Phe Asn Asn Glu Gly Gln  
85 90 95

Leu Val Phe Leu Leu Ala Phe Glu Gly Gly Asp Asp Gly Phe  
 100 105 110  
 Phe Gly Gly Val Gly Val Val His Ala Ala Ala Val Leu Arg Thr Gly  
 115 120 125  
 Val Val Ala Leu Phe Val Glu Ala Gly Arg Ile Asn Asp Ala Glu Glu  
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 Ile Leu Gln Asp Val Val Ala Glu Phe Val Gly Ile Val Gly His Phe  
 145 150 155 160  
 Asp Gly Phe Gly Val Ala Arg Met Ala Val Gly His Val Phe Ile Ala  
 165 170 175  
 Arg Ile Phe Arg Val Ala Val Gly Val Ala Gly Tyr Arg Val Asn His  
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 <212> DNA  
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Glu Arg Tyr Phe Ala Asp Asp Lys Phe	Val Gly Leu Val Leu Arg Gly	
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Asn Leu Arg Val Phe Gln Thr Asp Lys	Ala Asp Leu Arg Thr Gly Lys	
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His His Ala Asn Gly Ala Ala Ala Gln	Thr Ala Ala Asp Ile Arg Val	
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Cys Ser Arg Gly Ser Trp Leu Asp Ala Ser	Pro Ala Ile Lys Ile Cys	
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145	150	155
Ala Ser Leu Ser Ile Leu Met Phe Ser	Lys Pro Ile Leu Ser Thr Phe	
165	170	175
Gly Arg Arg Pro Thr Ala Ala Asn Ile	Tyr Ser Ala Thr Asn Thr Pro	
180	185	190
Phe Ser Pro Ser Cys Ser Gln Trp Thr	Ser Thr Leu Pro Ser Ala Ser	
195	200	205
Ser Leu Thr Ser Val Leu Ala Ser Arg	Cys Ser Phe Asn Ser Ser Pro	
210	215	220
Asn Thr Ala Phe Ala Ser Ser Glu Thr	Thr Gly Ser Glu Met Pro Pro	
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<213> Neisseria meningitidis

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<213> Neisseria meningitidis

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Asp Phe Arg Ala Asp Lys Ala Ala Gly Gly Phe Phe Gly Ile Gln Ala  
35 40 45

His Met Ala Phe Val His Gln His His Ala Ala Ala Ala Leu Val Phe  
50 55 60

Glu Arg Tyr Phe Ala Asp Asp Lys Phe Val Gly Leu Val Leu Arg Gly  
65 70 75 80

Asn Leu Arg Val Phe Gln Thr Asp Lys Ala Asp Leu Arg Thr Gly Lys  
85 90 95

His His Ala Asp Gly Ala Ala Pro Gln Thr Ala Ala Asp Ile Arg Val  
100 105 110

Ala Ala Ala Leu Ser Pro Ala Ile Leu Pro Trp Ser Ala Ala Ser Cys  
115 120 125

Ser Arg Gly Ser Trp Leu Asp Ala Ser Pro Ala Met Lys Ile Cys Gly  
130 135 140

Ile Leu Val Cys Met Val Ser Gly Ser Ala Thr Gly Thr Pro Arg Ala  
145 150 155 160

Ser Phe Ser Ile Leu Ile Phe Ser Lys Pro Ile Leu Ser Thr Phe Gly  
165 170 175

Arg Arg Pro Thr Ala Ala Ser Ile Tyr Ser Ala Thr Asn Thr Pro Phe  
180 185 190

Ser Pro Ser Cys Ser Gln Trp Thr Ser Thr Leu Pro Ser Ala Ser Ser  
195 200 205

Leu Thr Ser Val Leu Ala Ser Arg Cys Ser Phe Asn Ser Ser Pro Asn

210 215 220

Thr Ala Phe Ala Ser Ser Glu Thr Thr Gly Ser Glu Met Pro Pro Met  
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<213> Neisseria meningitidis

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<213> Neisseria meningitidis

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Asp Phe Cys Ala Asp Glu Ala Ala Gly Gly Phe Phe Gly Ile Gln Ala  
35 40 45

His Met Ala Phe Val Tyr Gln His His Ala Ala Ala Leu Val Phe  
50 55 60

Glu Arg Tyr Phe Ala Asp Asp Lys Phe Val Gly Leu Val Leu Arg Gly  
65 70 75 80

Asn Leu Arg Val Phe Gln Thr Asp Lys Ala Asp Leu Arg Thr Gly Glu

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His Tyr Ala Asp Gly Ala Ala Ala Gln Thr Ala Ala Asp Ile Arg Val		
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Ser Arg Gly Ser Trp Leu Asp Ala Ser Pro Ala Ile Lys Ile Cys Gly		
130	135	140
Ile Leu Val Cys Ile Val Ser Gly Ser Ala Thr Gly Thr Pro Arg Ala		
145	150	155
Ser Phe Ser Ile Leu Met Phe Ser Lys Pro Ile Leu Ser Thr Phe Gly		
165	170	175
Arg Arg Pro Thr Ala Ala Ser Ile Tyr Ser Ala Thr Asn Thr Pro Phe		
180	185	190
Ser Pro Ser Cys Ser Gln Trp Thr Ser Thr Leu Pro Ser Ala Ser Ser		
195	200	205
Leu Ala Ser Val Leu Ala Ser Lys Cys Ser Phe Asn Ser Ser Pro Asn		
210	215	220
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Met Pro Pro Lys Pro Lys Ile Ser Thr Phe Thr Pro Lys Arg Cys Asn		
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<212> DNA  
<213> Neisseria gonorrhoeae

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gtactgacag attttcggaa aaattataaa aaacacggc aatcgtttga aacattcttt 240  
ttaagcggagg aagagacaaa acatcaggaa aaaaaaagaaa agaaaaagga aaaggcggaa 300  
gc当地  
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tatatgtgg cgtgtgtggc ggataaaatt gttccgctc cgatggcggt catcggttcg 660  
gtgggtgtgg tggcgaagt gccgaatatac caccgcgtt tgaaaaaaca tgatattgtat 720  
gtggatgtga tgacggcggc cgaatttaag cgcacggta cttttatggg tgaaaatacg 780  
gaaaaggcga aacagaaatt ccggcaggaa ctggaggaaa cgcacgtt gttcaaggcag 840  
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ttcggccggc aggcggtggc gttgaacttg attgacgaga tttcgaccag tgatgattt 960  
tttgtgaaag cgtttggaaa caaacagggt atcgaagtga aatatcagga gaagcgaagc 1020  
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<210> 20  
<211> 368  
<212> PRT  
<213> Neisseria gonorrhoeae

<400> 20  
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20 25 30  
  
Glu Leu Leu Thr Val Phe Gly Ala Ile Ala Leu Ile Val Leu Ala Ile  
35 40 45  
  
Val Gln Ser Lys Lys Gln Ser Glu Ser Gly Ser Val Val Leu Thr Asp  
50 55 60  
  
Phe Ser Glu Asn Tyr Lys Lys Gln Arg Gln Ser Phe Glu Thr Phe Phe  
65 70 75 80  
  
  
Leu Ser Glu Glu Glu Thr Lys His Gln Glu Lys Lys Glu Lys Lys Lys  
85 90 95  
  
Glu Lys Ala Glu Ala Lys Ala Glu Lys Lys Arg Leu Lys Glu Gly Gly  
100 105 110  
  
Glu Lys Ser Ala Glu Thr Gln Lys Ser Arg Leu Phe Val Leu Asp Phe  
115 120 125  
  
Asp Gly Asp Leu Tyr Ala His Ala Val Glu Ser Leu Arg His Glu Ile  
130 135 140  
  
Thr Ala Val Leu Leu Ile Ala Lys Pro Glu Asp Glu Val Leu Leu Arg  
145 150 155 160  
  
Leu Glu Ser Pro Gly Gly Val Val His Gly Tyr Gly Leu Ala Ala Ser  
165 170 175  
  
Gln Leu Arg Arg Leu Arg Glu Arg Asn Ile Pro Leu Thr Val Ala Val  
180 185 190  
  
Asp Lys Val Ala Ala Ser Gly Gly Tyr Met Met Ala Cys Val Ala Asp  
195 200 205  
  
Lys Ile Val Ser Ala Pro Phe Ala Val Ile Gly Ser Val Gly Val Val  
210 215 220  
  
Ala Glu Val Pro Asn Ile His Arg Leu Leu Lys Lys His Asp Ile Asp  
225 230 235 240

Val Asp Val Met Thr Ala Gly Glu Phe Lys Arg Thr Val Thr Phe Met  
245 250 255

Gly Glu Asn Thr Glu Lys Gly Lys Gln Lys Phe Arg Gln Glu Leu Glu  
260 265 270

Glu Thr His Gln Leu Phe Lys Gln Phe Val Ser Glu Asn Arg Pro Gly  
275 280 285

Leu Asp Ile Glu Lys Ile Ala Thr Gly Glu His Trp Phe Gly Arg Gln  
290 295 300

Ala Leu Ala Leu Asn Leu Ile Asp Glu Ile Ser Thr Ser Asp Asp Leu  
305 310 315 320

Leu Leu Lys Ala Phe Glu Asn Lys Gln Val Ile Glu Val Lys Tyr Gln  
325 330 335

Glu Lys Arg Ser Leu Ile Gln Arg Ile Gly Leu Gln Ala Glu Ala Ser  
340 345 350

Val Glu Lys Leu Phe Ala Lys Leu Val Asn Arg Arg Ala Asp Val Met  
355 360 365

<210> 21  
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<212> DNA  
<213> Neisseria meningitidis

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<222> (350)  
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<220>  
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<222> (374)..(581)  
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ctgatttgtt tggctatcgt acagagtaag aaacagtcgg awagcggcag tgtcgtaactg 180  
acggattttt cggaaaatta taaaaaacag cggcaatcgt ttgaagcatt cttttaagc 240  
ggggaaagagg cacaacatca ggaaaaagag gaaaagaaaa aggaaaaggc ggaagccaaa 300  
gcagagaaaa acgtttgaag gaggggtgggg agaaatctgc cgaaaacgc an aaatcacgcc 360  
tttttgtt ggannnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 420  
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tggcgtgtt ggcggataaa attgcttccg ctccgttgc gattgtcgt tcggtggtg 660  
tggtggcga agtaccgaat atccaccgccc tggtgaaaaa acatgatatt gatgtggatg 720

tgatgacggc gggcgaattt aagcgcacgg ttactttat gggtgaaaat acgaaaaagg 780  
gcaaacagaa attccgacag gaactggagg aaacgcata gttgttcaag cagtttgtca 840  
gcgagaaccg ccctcaattt gatattgagg aagtggcaac gggcgagcat tggttcggtc 900  
ggcaggcggtt ggcgttgaac ttgattgacg agatttcgac cagtgtatgtat ttgttgtga 960  
aagcgttga aaacaacag gtatcgaag tgaaatatca ggagaagcaa agcctgatcc 1020  
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<210> 22  
<211> 366  
<212> PRT  
<213> Neisseria meningitidis

<220>  
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<220>  
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Met Trp Lys Glu Ile Leu Leu Asn Tyr Gly Ile Phe Leu Leu Glu Leu  
20 25 30

Leu Thr Val Phe Gly Ala Ile Ala Leu Ile Val Leu Ala Ile Val Gln  
35 40 45

Ser Lys Lys Gln Ser Xaa Ser Gly Ser Val Val Leu Thr Asp Phe Ser  
50 55 60

Glu Asn Tyr Lys Lys Gln Arg Gln Ser Phe Glu Ala Phe Phe Leu Ser  
65 70 75 80

Gly Glu Glu Ala Gln His Gln Glu Lys Glu Glu Lys Lys Lys Glu Lys  
85 90 95

Ala Glu Ala Lys Ala Glu Lys Xaa Arg Leu Lys Glu Gly Gly Glu Lys  
100 105 110

Ser Ala Glu Thr Xaa Lys Ser Arg Leu Phe Val Leu Xaa Xaa Xaa Xaa  
 115 120 125  
 Xaa  
 130 135 140  
 Xaa  
 145 150 155 160  
 Xaa  
 165 170 175  
 Xaa  
 180 185 190  
 Xaa Xaa Ala Ser Gly Gly Tyr Met Met Ala Cys Val Ala Asp Lys Ile  
 195 200 205  
 Ala Ser Ala Pro Phe Ala Ile Val Gly Ser Val Gly Val Val Ala Glu  
 210 215 220  
 Val Pro Asn Ile His Arg Leu Leu Lys Lys His Asp Ile Asp Val Asp  
 225 230 235 240  
 Val Met Thr Ala Gly Glu Phe Lys Arg Thr Val Thr Phe Met Gly Glu  
 245 250 255  
 Asn Thr Glu Lys Gly Lys Gln Lys Phe Arg Gln Glu Leu Glu Glu Thr  
 260 265 270  
 His Gln Leu Phe Lys Gln Phe Val Ser Glu Asn Arg Pro Gln Leu Asp  
 275 280 285  
 Ile Glu Glu Val Ala Thr Gly Glu His Trp Phe Gly Arg Gln Ala Leu  
 290 295 300  
 Ala Leu Asn Leu Ile Asp Glu Ile Ser Thr Ser Asp Asp Leu Leu Leu  
 305 310 315 320  
 Lys Ala Phe Glu Asn Lys Gln Val Ile Glu Val Lys Tyr Gln Glu Lys  
 325 330 335  
 Gln Ser Leu Ile Gln Arg Ile Gly Leu Gln Ala Glu Ala Ser Val Glu  
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 Lys Leu Phe Ala Lys Leu Val Asn Arg Arg Ala Asp Val Met  
 355 360 365

<210> 23  
 <211> 1101  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 23  
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ctgattgtgt tggctatcgt acagagtaag aaacagtcgg aaagcggcag tgcgtactg 180  
acggattttt cgaaaaatta taaaaaacag cggcaatcg ttgaagcatt cttttaagc 240  
ggggaaagagg caaaaacatca gaaaaaagag gaaaagaaaa aggaaaaggc ggaagccaaa 300  
gcagagaaaa agcgttgaa ggagggtggg gagaatctt ccgaaacgc aaaaatcccgc 360  
cttttgtgt tggatttga cgccgatttg tatgcacacg ccgtagaatc cttgcgtcat 420  
gagattacgg cggcgtttt gattgccaag cctgaagatg aggttctgct tagattggaa 480  
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gaacgcaata ttccgctgac cgtcgccgtc gataaggtgg cggcgagcgg tggttatatg 600  
atggcgtgtg tggcggataa aattgtttcc gctccgttg cgattgtcgg ttcgggggt 660  
gtttagcgg aagtaccgaa tatccaccgc ctgttggaaa aacatgatat tgatgtggat 720  
gtgatgacgg cggcgaatt taagcgcacg gttactttt tgggtggaaa tacggaaaag 780  
ggcaaacaga aattccgaca ggaactggag gaaacgcac agttgttcaa gcagttgtc 840  
agcgagaacc gccctcaatt gatatggag gaagtggcaa cggcgagaca ttgggtcggt 900  
cggcaggcgt tggcgttgaa ctgtatttgc gagatttcga ccagtgtatg tttgttgg 960  
aaagcgtttggaaaaca gtttatcgaa gtgaardatc aggagaagaca aagcctgatc 1020  
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<210> 24

<211> 366

<212> PRT

<213> Neisseria meningitidis

<400> 24

Met Asp Asn Ile Asp Met Phe Met Pro Glu Gln Glu Glu Ile Gln Ser  
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Met Trp Lys Glu Ile Leu Leu Asn Tyr Gly Ile Phe Leu Leu Glu Leu  
20 25 30

Leu Thr Val Phe Gly Ala Ile Ala Leu Ile Val Leu Ala Ile Val Gln  
35 40 45

Ser Lys Lys Gln Ser Glu Ser Gly Ser Val Val Leu Thr Asp Phe Ser  
50 55 60

Glu Asn Tyr Lys Lys Gln Arg Gln Ser Phe Glu Ala Phe Phe Leu Ser  
65 70 75 80

Gly Glu Glu Ala Lys His Gln Glu Lys Glu Glu Lys Lys Glu Lys  
85 90 95

Ala Glu Ala Lys Ala Glu Lys Lys Arg Leu Lys Glu Gly Gly Glu Lys  
100 105 110

Ser Ser Glu Thr Gln Lys Ser Arg Leu Phe Val Leu Asp Phe Asp Gly  
115 120 125

Asp Leu Tyr Ala His Ala Val Glu Ser Leu Arg His Glu Ile Thr Ala  
130 135 140

Val Leu Leu Ile Ala Lys Pro Glu Asp Glu Val Leu Leu Arg Leu Glu  
145 150 155 160

Ser Pro Gly Gly Val Val His Gly Tyr Gly Leu Ala Ala Ser Gln Leu  
165 170 175

Arg Arg Leu Arg Glu Arg Asn Ile Pro Leu Thr Val Ala Val Asp Lys  
180 185 190

Val Ala Ala Ser Gly Gly Tyr Met Met Ala Cys Val Ala Asp Lys Ile  
195 200 205

Val Ser Ala Pro Phe Ala Ile Val Gly Ser Val Gly Val Val Ala Glu  
210 215 220

Val Pro Asn Ile His Arg Leu Leu Lys Lys His Asp Ile Asp Val Asp  
225 230 235 240

Val Met Thr Ala Gly Glu Phe Lys Arg Thr Val Thr Phe Met Gly Glu  
245 250 255

Asn Thr Glu Lys Gly Lys Gln Lys Phe Arg Gln Glu Leu Glu Glu Thr  
260 265 270

His Gln Leu Phe Lys Gln Phe Val Ser Glu Asn Arg Pro Gln Leu Asp  
275 280 285

Ile Glu Glu Val Ala Thr Gly Glu His Trp Phe Gly Arg Gln Ala Leu  
290 295 300

Ala Leu Asn Leu Ile Asp Glu Ile Ser Thr Ser Asp Asp Leu Leu Leu  
305 310 315 320

Lys Ala Phe Glu Asn Lys Gln Val Ile Glu Val Lys Tyr Gln Glu Lys  
325 330 335

Gln Ser Leu Ile Gln Arg Ile Gly Leu Gln Ala Glu Ala Ser Val Glu  
340 345 350

Lys Leu Phe Ala Lys Leu Val Asn Arg Arg Ala Asp Val Met  
355 360 365

<210> 25  
<211> 462  
<212> DNA  
<213> Neisseria gonorrhoeae

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agcttggAAC gcgacAAccA ctttatccGA aaaggcGACG agcggcAGCT gtaccGCCAT 180  
tacggactgg tttcgcgcct gcgtgtgctg atttccaacc gCGAAGCCTT CGGCTATCTC 240  
tgcgtcggcg cggcgatggg tattttgttc ggctttgcTT ttgtatgtat gacgctcaaa 300  
ggctacggca gcgcgggca tatttattcg gtcggcactt atctgtggat gtttgccatg 360  
agtttggacg atgtggcgcg attgggtcgaa caatattcca atttggaaaga catcgacaa 420  
cgatagatggat ggtcgaaacg gaacatcaaa gccggaaactt ga 462

<210> 26  
<211> 153  
<212> PRT

<213> Neisseria gonorrhoeae

<400> 26

Met Leu Leu Val Leu Glu Phe Trp Phe Gly Val Ser Ala Val Gly Ile  
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Leu Ala Leu Phe Leu Trp Leu Leu Pro Arg Phe Ala Ala Ile Ser Glu  
20 25 30

Asn Leu Tyr Phe Arg Leu Asn Asn Ser Leu Glu Arg Asp Asn His Phe  
35 40 45

Ile Arg Lys Gly Asp Glu Arg Gln Leu Tyr Arg His Tyr Gly Leu Val  
50 55 60

Ser Arg Leu Arg Val Leu Ile Ser Asn Arg Glu Ala Phe Gly Tyr Leu  
65 70 75 80

Cys Val Gly Ala Ala Met Gly Ile Leu Phe Gly Phe Ala Phe Val Met  
85 90 95

Met Thr Leu Lys Gly Tyr Gly Ser Ala Gly His Ile Tyr Ser Val Gly  
100 105 110

Thr Tyr Leu Trp Met Phe Ala Met Ser Leu Asp Asp Val Pro Arg Leu  
115 120 125

Val Glu Gln Tyr Ser Asn Leu Lys Asp Ile Gly Gln Arg Ile Glu Trp  
130 135 140

Ser Glu Arg Asn Ile Lys Ala Gly Thr  
145 150

<210> 27

<211> 462

<212> DNA

<213> Neisseria meningitidis

<400> 27

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tacggactgc ttgcgcgcct gcgtgtgctg atttccaacc gcgaagcctt cggctatctc 240  
tgcgtcggca cggcgatggg tattttgttc ggcttgctt ttgtgatgat gacgctaaa 300  
ggctacagca gcgccccca tgcatttc gtcggcactt atctgtggat gtttgcctatg 360  
agtttggacg acgtggcgcg attggatcaa caatattcca atttggaaaga catggacaa 420  
cgatagatggat ggtcggaacg gaacatcaa gcccggactt ga 462

<210> 28

<211> 153

<212> PRT

<213> Neisseria meningitidis

<400> 28

Met Leu Leu Val Leu Glu Phe Trp Val Gly Val Ser Ala Val Gly Ile

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20	25	30	
Asn Leu Tyr Phe Arg Leu Asn Asn Ser Leu Glu Arg Asp Asn His Phe			
35	40	45	
Ile Arg Lys Gly Asp Arg Arg Gln Leu Tyr Arg His Tyr Gly Leu Leu			
50	55	60	
Ala Arg Leu Arg Val Leu Ile Ser Asn Arg Glu Ala Phe Gly Tyr Leu			
65	70	75	80
Cys Val Gly Thr Ala Met Gly Ile Leu Phe Gly Phe Ala Phe Val Met			
85	90	95	
Met Thr Leu Lys Gly Tyr Ser Ser Ala Gly His Val Tyr Ser Val Gly			
100	105	110	
Thr Tyr Leu Trp Met Phe Ala Met Ser Leu Asp Asp Val Pro Arg Leu			
115	120	125	
Val Glu Gln Tyr Ser Asn Leu Lys Asp Ile Gly Gln Arg Ile Glu Trp			
130	135	140	
Ser Glu Arg Asn Ile Lys Ala Gly Thr			
145	150		

<210> 29

<211> 462

<212> DNA

<213> Neisseria meningitidis

<400> 29

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agcttggAAC gcgacaacca ctttatccga aaaggcgacg agcggcagct ggaccggccat 180
tacggactgc ttgcgcgcct gcgtgtgctg atttccaacc gcgaagccctt cggctatctc 240
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ggctacagca gcgcggggca tgtctattcg gtcggcactt atctgtggat gtttgc当地 360
agtttggacg acgtggcgcg attgggtcga caatattcca atttgaaaga catcgacaa 420
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<210> 30

<211> 153

<212> PRT

<213> Neisseria meningitidis

<400> 30

Met Leu Leu Val Leu Glu Phe Trp Val Gly Val Ser Ala Val Gly Ile			
1	5	10	15

Leu Ala Leu Phe Leu Trp Leu Leu Pro Arg Phe Ala Ala Ile Ser Glu

20	25	30
Asn Leu Tyr Phe Arg Leu Lys Asn Ser Leu Glu Arg Asp Asn His Phe		
35	40	45
Ile Arg Lys Gly Asp Glu Arg Gln Leu Asp Arg His Tyr Gly Leu Leu		
50	55	60
Ala Arg Leu Arg Val Leu Ile Ser Asn Arg Glu Ala Phe Gly Tyr Leu		
65	70	75
Cys Val Gly Thr Ala Met Gly Ile Leu Phe Gly Phe Ala Phe Val Met		
85	90	95
Met Thr Leu Lys Gly Tyr Ser Ser Ala Gly His Val Tyr Ser Val Gly		
100	105	110
Thr Tyr Leu Trp Met Phe Ala Ile Ser Leu Asp Asp Val Pro Arg Leu		
115	120	125
Val Glu Gln Tyr Ser Asn Leu Lys Asp Ile Gly Gln Arg Ile Glu Trp		
130	135	140
Ser Lys Arg Asn Ile Lys Ala Gly Thr		
145	150	

<210> 31  
 <211> 867  
 <212> DNA  
 <213> Neisseria gonorrhoeae

<400> 31  
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 ttgatgtggc tggtcggtgc ggcacggcgg attgcccata cgccgcacgtt tacgcggatt 240  
 tataccgaaa tcgccgtgcc gggtgtgttg gaacaacggc agcggcaagt cccgcattca 300  
 gcggtaactg cacgggttgc cctgtcgctgtaa gattttgtca gcttttttga agaacacctg 360  
 ccgattgccc cgacatccgt cgtatccata ttcggcgcgt gcatcatgt gctggtgctg 420  
 gaattttggg tcggcggtgc ggcgggtggc atacttgcgt tggtttatg gcttttgcca 480  
 cggtttggcg ccatcagcga aaacactgtat ttccgcctgaa acaacagctt ggaacgcgac 540  
 aaccacttta tccgaaaagg cgacgagcgg cagctgtacc gccattacgg actggtttcg 600  
 cgccctgcgtg tgctgatttc caaccgcgaa gccttcggct atctctgcgt cggcgcggcg 660  
 atgggtattt tggtcggttc tgctttgtt atgatgacgc tcaaaggcta cggcagcgcg 720  
 gggcatattt attcggtcgg cacttatctg tggatgttttgc ccatgagttt ggacgatgtg 780  
 ccgcgattgg tcgaacaata ttccaatttg aaagacatcg gacaacggat agagtggcg 840  
 gaacggaaca tcaaaggccgg aacttga 867

<210> 32  
 <211> 288  
 <212> PRT  
 <213> Neisseria gonorrhoeae

<400> 32  
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Ile Gly Thr Phe Ser Pro Val Gly Leu Glu Asn Leu Leu Met Leu Gly  
20                    25                    30

Tyr Pro Val Phe Gly Gly Trp Ala Ile Asn Ala Val Ile Ala Gly Arg  
35                    40                    45

Val Trp Gln Ala Leu Leu Tyr Ala Leu Val Val Phe Leu Met Trp Leu  
50                    55                    60

Val Gly Ala Ala Arg Arg Ile Ala Asp Thr Arg Thr Phe Thr Arg Ile  
65                    70                    75                    80

Tyr Thr Glu Ile Ala Val Pro Val Val Leu Glu Gln Arg Gln Arg Gln  
85                    90                    95

Val Pro His Ser Ala Val Thr Ala Arg Val Ala Leu Ser Arg Glu Phe  
100                    105                    110

Val Ser Phe Phe Glu Glu His Leu Pro Ile Ala Ala Thr Ser Val Val  
115                    120                    125

Ser Ile Phe Gly Ala Cys Ile Met Leu Leu Val Leu Glu Phe Trp Val  
130                    135                    140

Gly Val Ser Ala Val Gly Ile Leu Ala Leu Phe Leu Trp Leu Leu Pro  
145                    150                    155                    160

Arg Phe Ala Ala Ile Ser Glu Asn Leu Tyr Phe Arg Leu Asn Asn Ser  
165                    170                    175

Leu Glu Arg Asp Asn His Phe Ile Arg Lys Gly Asp Glu Arg Gln Leu  
180                    185                    190

Tyr Arg His Tyr Gly Leu Val Ser Arg Leu Arg Val Leu Ile Ser Asn  
195                    200                    205

Arg Glu Ala Phe Gly Tyr Leu Cys Val Gly Ala Ala Met Gly Ile Leu  
210                    215                    220

Phe Gly Phe Ala Phe Val Met Met Thr Leu Lys Gly Tyr Gly Ser Ala  
225                    230                    235                    240

Gly His Ile Tyr Ser Val Gly Thr Tyr Leu Trp Met Phe Ala Met Ser  
245                    250                    255

Leu Asp Asp Val Pro Arg Leu Val Glu Gln Tyr Ser Asn Leu Lys Asp  
260                    265                    270

Ile Gly Gln Arg Ile Glu Trp Ser Glu Arg Asn Ile Lys Ala Gly Thr  
275                    280                    285

<210> 33  
<211> 867  
<212> DNA  
<213> *Neisseria meningitidis*

<400> 33  
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atcaatgcgg tgattgcggg ggagggtgtgg caggcgttgc tgtacgctt gtttgtgtt 180  
ttgatgtggc tggtcggtgc ggtcgccgg attgccata cgccgacgtt tacgcggatt 240  
tataccgaaa tcgcgtgcc ggtcggttg gaacagcggc agcgacaaagt cccgcattcg 300  
gcggtaactg cgccgggttc cctgtcgcgt gagttgtca gcttttga agaacacctg 360  
ccgattgcgg cgacatccgt cgtatccata ttccggcggt gcatacatgtt gctgggtgt 420  
gaattttggg tcggcggttc ggcgggtggc atactgtat tgttttatg gcttttgc 480  
cgttttgcgg ccatcagcga aaacctgtat ttccgcctga acaacagctt ggaacgcgac 540  
aaccacttta tccgaaaagg cgaccggcgg cagctgtacc gccattacgg actgttttgc 600  
cgccctgcgtg tgctgatttc caaccgcgaa gccttcggct atctctgcgt cgccacggc 660  
atgggtattt ttttcggctt tgctttgtt atgatgacgc tcaaaggcta cagcagcgc 720  
ggccatgtct attcggtcgg cacttatctg tggatgtttt ccatgagttt ggacgacgtg 780  
ccgcgattgg tcaacaata ttccaatttg aaagacatcg gacaacggat agagtggtcg 840  
gaacggaaaca tcaaaggccgg aacttga 867

<210> 34  
<211> 288  
<212> PRT  
<213> *Neisseria meningitidis*

Gly Val Ser Ala Val Gly Ile Leu Ala Leu Phe Leu Trp Leu Leu Pro  
 145 150 155 160  
 Arg Phe Ala Ala Ile Ser Glu Asn Leu Tyr Phe Arg Leu Asn Asn Ser  
 165 170 175  
 Leu Glu Arg Asp Asn His Phe Ile Arg Lys Gly Asp Arg Arg Gln Leu  
 180 185 190  
 Tyr Arg His Tyr Gly Leu Leu Ala Arg Leu Arg Val Leu Ile Ser Asn  
 195 200 205  
 Arg Glu Ala Phe Gly Tyr Leu Cys Val Gly Thr Ala Met Gly Ile Leu  
 210 215 220  
 Phe Gly Phe Ala Phe Val Met Met Thr Leu Lys Gly Tyr Ser Ser Ala  
 225 230 235 240  
 Gly His Val Tyr Ser Val Gly Thr Tyr Leu Trp Met Phe Ala Met Ser  
 245 250 255  
 Leu Asp Asp Val Pro Arg Leu Val Glu Gln Tyr Ser Asn Leu Lys Asp  
 260 265 270  
 Ile Gly Gln Arg Ile Glu Trp Ser Glu Arg Asn Ile Lys Ala Gly Thr  
 275 280 285

<210> 35  
 <211> 843  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 35  
 agccaaaacc accgcaagcg attgattggc acatttttc tggtcggact ggaaaacctt 60  
 ttgatgtgg tgtatccgg ttttggcgcc tgggcgatta atgccgtat tgcggggcag 120  
 gcggtggcagg cgttgctgta cgctttgggt gtgctttga tggctggctgtt cgggtgcggcg 180  
 cggcggattt ccgataacgcg cacgtttacg cggatttata ccgaaatcgc cgtgccgggtt 240  
 gtgttggAAC agcggcagcg gcaagtcccg cattcggcgg taactgcgcg ggttgccttg 300  
 tcgcgtgagt ttgtcagctt ttttgaagaaa cacctgcccga ttgcccgcac atccgtcgta 360  
 tccatattcg gcgcgtgcat catgctgctg gtgctggaaat tttgggtcgg cgtgtcggcg 420  
 gtggggcatac ttgcgttgtt tttatggctt ttgccacgtt ttgcccgcatt cagcgaaaaac 480  
 ctgtatttcc gcctgaagaa cagcttggaa cgcgacaacc actttatccg aaaaggcgac 540  
 gagcggcagc tggaccgcca ttacggactg cttggcgcc tgcgtgtgct gatttccaac 600  
 cgcgaagcct tcggctatct ctgcgtcgcc acggcgatgg gtatTTGTT cggctttgtt 660  
 tttgtgtatga tgacgctcaa aggctacagc agcgcggggc atgtctattc ggtcggcact 720  
 tatctgtgga tggccat aagtttggac gacgtgccgc gattggtcga acaatattcc 780  
 aatttggaaag acatcgacgac acggatagag tggtcgaaac ggaacatcaa agccggaaact 840  
 tga 843

<210> 36  
 <211> 280  
 <212> PRT

<213> Neisseria meningitidis

<400> 36

Ser Gln Asn His Arg Lys Arg Leu Ile Gly Thr Phe Phe Leu Val Gly  
1 5 10 15

Leu Glu Asn Leu Leu Met Leu Val Tyr Pro Val Phe Gly Gly Trp Ala  
20 25 30

Ile Asn Ala Val Ile Ala Gly Gln Ala Trp Gln Ala Leu Leu Tyr Ala  
35 40 45

Leu Val Val Leu Leu Met Trp Leu Val Gly Ala Ala Arg Arg Ile Ala  
50 55 60

Asp Thr Arg Thr Phe Thr Arg Ile Tyr Thr Glu Ile Ala Val Pro Val  
65 70 75 80

Val Leu Glu Gln Arg Gln Arg Gln Val Pro His Ser Ala Val Thr Ala  
85 90 95

Arg Val Ala Leu Ser Arg Glu Phe Val Ser Phe Phe Glu Glu His Leu  
100 105 110

Pro Ile Ala Ala Thr Ser Val Val Ser Ile Phe Gly Ala Cys Ile Met  
115 120 125

Leu Leu Val Leu Glu Phe Trp Val Gly Val Ser Ala Val Gly Ile Leu  
130 135 140

Ala Leu Phe Leu Trp Leu Leu Pro Arg Phe Ala Ala Ile Ser Glu Asn  
145 150 155 160

Leu Tyr Phe Arg Leu Lys Asn Ser Leu Glu Arg Asp Asn His Phe Ile  
165 170 175

Arg Lys Gly Asp Glu Arg Gln Leu Asp Arg His Tyr Gly Leu Leu Ala  
180 185 190

Arg Leu Arg Val Leu Ile Ser Asn Arg Glu Ala Phe Gly Tyr Leu Cys  
195 200 205

Val Gly Thr Ala Met Gly Ile Leu Phe Gly Phe Ala Phe Val Met Met  
210 215 220

Thr Leu Lys Gly Tyr Ser Ser Ala Gly His Val Tyr Ser Val Gly Thr  
225 230 235 240

Tyr Leu Trp Met Phe Ala Ile Ser Leu Asp Asp Val Pro Arg Leu Val  
245 250 255

Glu Gln Tyr Ser Asn Leu Lys Asp Ile Gly Gln Arg Ile Glu Trp Ser  
260 265 270

Lys Arg Asn Ile Lys Ala Gly Thr  
275 280

<210> 37  
<211> 342  
<212> DNA  
<213> Neisseria gonorrhoeae

<400> 37  
atgaacacaaa cccgactgcc gaccgccttc atcttgtgct gcctctgcgc cgccgcttct 60  
gcccggaca acagcatcat gacaaaaggg caaaaagtgt acgaatccaa ctgcattcgcc 120  
tgccacggca agaaaggggg aggccgcggc actgcgtttc ctccgctttt ccggctggac 180  
tgtattatga acaaaccgca cgtcctgctg cacagcatgg tcaaaggcat cgacgggaca 240  
ttcaaagtgg agcggaaaaa cctacgacgg atttatgccc gcaaccgcca tcagcgatgc 300  
ggacattgcc gccgtcgcca cttatatcat gaacgcctt ga 342

<210> 38  
<211> 113  
<212> PRT  
<213> Neisseria gonorrhoeae

<400> 38  
Met Asn Thr Thr Arg Leu Pro Thr Ala Phe Ile Leu Cys Cys Leu Cys  
1 5 10 15

Ala Ala Ala Ser Ala Ala Asp Asn Ser Ile Met Thr Lys Gly Gln Lys  
20 25 30

Val Tyr Glu Ser Asn Cys Ile Ala Cys His Gly Lys Lys Gly Glu Gly  
35 40 45

Arg Gly Thr Ala Phe Pro Pro Leu Phe Arg Ser Asp Cys Ile Met Asn  
50 55 60

Lys Pro His Val Leu Leu His Ser Met Val Lys Gly Ile Asp Gly Thr  
65 70 75 80

Phe Lys Val Glu Arg Gln Asn Leu Arg Arg Ile Tyr Ala Arg Asn Arg  
85 90 95

His Gln Arg Cys Gly His Cys Arg Arg Arg His Leu Tyr His Glu Arg  
100 105 110

Leu

<210> 39  
<211> 341  
<212> DNA  
<213> Neisseria meningitidis

<400> 39  
atgaacacaaa cccgactgcc gaccgccttc gtctgggtc gcttctgcgc cgccgcttct 60  
gcccggaca acagcatcat gacaaaaggg caaaaagtgt acgaatccaa ctgcattcgcc 120  
tgccacggca aaaaggcgaa aggccgcggc accatgtttc cgccgctcta ccgctccgac 180  
ttcatcatga aaaaaccgca ggtgctgctg cacagcatgg tcaaaggcat caacggata 240

atcaaagtca acggcaaaac ctacaacgga ttcatgccc caaccgccat cagcgatgcg 300  
gacattgccg ccgtcgccac ttatatcatg aacgccttg a 341

<210> 40  
<211> 113  
<212> PRT  
<213> Neisseria meningitidis

<220>  
<221> UNSURE  
<222> (84)  
<223> Xaa is any amino acid

<400> 40  
Met Asn Thr Thr Arg Leu Pro Thr Ala Leu Val Leu Gly Cys Phe Cys  
1 5 10 15

Ala Ala Ala Ser Ala Ala Asp Asn Ser Ile Met Thr Lys Gly Gln Lys  
20 25 30

Val Tyr Glu Ser Asn Cys Val Ala Cys His Gly Lys Lys Gly Glu Gly  
35 40 45

Arg Gly Thr Met Phe Pro Pro Leu Tyr Arg Ser Asp Phe Ile Met Lys  
50 55 60

Lys Pro Gln Val Leu Leu His Ser Met Val Lys Gly Ile Asn Gly Thr  
65 70 75 80

Ile Lys Val Xaa Arg Gln Asn Leu Gln Arg Ile His Ala Arg Asn Arg  
85 90 95

His Gln Arg Cys Gly His Cys Arg Arg Arg His Leu Tyr His Glu Arg  
100 105 110

Leu

<210> 41  
<211> 341  
<212> DNA  
<213> Neisseria meningitidis

<400> 41  
atgaacacaa cccgactgcc gaccgcctc gtcttggct gcctctgcgc cgccgcttct 60  
gccgccgaca acagcatcat gaçaaaaggg caaaaagtgt acgaatccaa ctgcgtcgcc 120  
tgccacggca aaaagggcga aggccgcggg accatgtttc cgccgctcta ccgctccgac 180  
ttcatcatga aaaaaccgca ggtgctgctg cacagcatgg tcaaaggcat caacggtaca 240  
atcaaagtca acggcaaaac ctacaacgga ttcatgccc ccactgccc cagcgatgcg 300  
gacattgccg ccgtcgccac ttatatcatg aacgccttg a 341

<210> 42  
<211> 341

<212> PRT

<213> Neisseria meningitidis

<400> 42  
Ala Thr Gly Ala Ala Cys Ala Cys Ala Ala Cys Cys Cys Gly Ala Cys  
1 5 10 15  
Thr Gly Cys Cys Gly Ala Cys Cys Gly Cys Cys Cys Thr Cys Gly Thr  
20 25 30  
Cys Thr Thr Gly Gly Cys Thr Gly Cys Cys Thr Cys Thr Gly Cys  
35 40 45  
Gly Cys Cys Gly Cys Cys Gly Cys Thr Thr Cys Thr Gly Cys Cys Gly  
50 55 60  
Cys Cys Gly Ala Cys Ala Ala Cys Ala Gly Cys Ala Thr Cys Ala Thr  
65 70 75 80  
Gly Ala Cys Ala Ala Ala Ala Gly Gly Cys Ala Ala Ala Ala Ala  
85 90 95  
Gly Thr Gly Thr Ala Cys Gly Ala Ala Thr Cys Cys Ala Ala Cys Thr  
100 105 110  
Gly Cys Gly Thr Cys Gly Cys Cys Thr Gly Cys Cys Ala Cys Gly Gly  
115 120 125  
Cys Ala Ala Ala Ala Ala Gly Gly Cys Gly Ala Ala Gly Gly Cys  
130 135 140  
Cys Gly Cys Gly Ala Ala Cys Cys Ala Thr Gly Thr Thr Thr Cys  
145 150 155 160  
Cys Gly Cys Cys Gly Cys Thr Cys Thr Ala Cys Cys Gly Cys Thr Cys  
165 170 175  
Cys Gly Ala Cys Thr Thr Cys Ala Thr Cys Ala Thr Gly Ala Ala Ala  
180 185 190  
Ala Ala Ala Cys Cys Gly Cys Ala Gly Gly Thr Gly Cys Thr Gly Cys  
195 200 205  
Thr Gly Cys Ala Cys Ala Gly Cys Ala Thr Gly Gly Thr Cys Ala Ala  
210 215 220  
Ala Gly Gly Cys Ala Thr Cys Ala Ala Cys Gly Gly Thr Ala Cys Ala  
225 230 235 240  
Ala Thr Cys Ala Ala Ala Gly Thr Cys Ala Ala Cys Gly Gly Cys Ala  
245 250 255  
Ala Ala Ala Cys Cys Thr Ala Cys Ala Ala Cys Gly Gly Ala Thr Thr  
260 265 270  
Cys Ala Thr Gly Cys Cys Gly Cys Cys Ala Cys Thr Gly Cys Cys  
275 280 285

Ala Thr Cys Ala Gly Cys Gly Ala Thr Gly Cys Gly Gly Ala Cys Ala  
290 295 300

Thr Thr Gly Cys Cys Gly Cys Cys Gly Thr Cys Gly Cys Cys Ala Cys  
305 310 315 320

Thr Thr Ala Thr Ala Thr Cys Ala Thr Gly Ala Ala Cys Gly Cys Cys  
325 330 335

Thr Thr Thr Gly Ala  
340

<210> 43

<211> 399

<212> DNA

<213> Neisseria gonorrhoeae

<400> 43

atgaacacaa cccgactgcc gaccgccttc atcttgtgct gcctctgcgc cgccgcttct 60  
gccggcgaca acagcatcat gacaaaaggg caaaaagtgt acgaatccaa ctgcatcgcc 120  
tgccacggca agaaagggga agggcgcggc actgcgtttc ctccgctttt ccggtcggac 180  
tatattatga acaaaccgca cgtcctgctg cacagcatgg tcaaaggcat caacggtaca 240  
atcaaagtca acggcaaaac ctacaacgga ttcatgcccg caaccgccat cagcgtatgcg 300  
gacattgcccggcgtcgccac ttatatcatg aacgcctttg acaacggcgg cggaagcgtt 360  
accgaaaaag acgtaaaaca ggcaaaaggc aaaaaaaac 399

<210> 44

<211> 133

<212> PRT

<213> Neisseria gonorrhoeae

<400> 44

Met Asn Thr Thr Arg Leu Pro Thr Ala Phe Ile Leu Cys Cys Leu Cys  
1 5 10 15

Ala Ala Ala Ser Ala Ala Asp Asn Ser Ile Met Thr Lys Gly Gln Lys  
20 25 30

Val Tyr Glu Ser Asn Cys Ile Ala Cys His Gly Lys Lys Gly Glu Gly  
35 40 45

Arg Gly Thr Ala Phe Pro Pro Leu Phe Arg Ser Asp Tyr Ile Met Asn  
50 55 60

Lys Pro His Val Leu Leu His Ser Met Val Lys Gly Ile Asn Gly Thr  
65 70 75 80

Ile Lys Val Asn Gly Lys Thr Tyr Asn Gly Phe Met Pro Ala Thr Ala  
85 90 95

Ile Ser Asp Ala Asp Ile Ala Ala Val Ala Thr Tyr Ile Met Asn Ala  
100 105 110

Phe Asp Asn Gly Gly Ser Val Thr Glu Lys Asp Val Lys Gln Ala

115

120

125

Lys Gly Lys Lys Asn  
130

<210> 45  
<211> 402  
<212> DNA  
<213> Neisseria meningitidis

<400> 45  
atgaacacaa cccgactgcc gaccgcctc gtctggct gcttctgcgc cgccgcttct 60  
gccgcccaca acagcatcat gacaaaaggg caaaaagtgt acgaatccaa ctgcgtcgcc 120  
tgccacggca aaaaggcgca aggccgcgga accatgtttc cgccgctcta ccgcctccgac 180  
ttcatcatga aaaaacccgca ggtgctgctg cacagcatgg tcaaaggcat caacggtaca 240  
atcaaagtca acggcaaaac ctacaacgga ttcatgcccc caaccgccat cagcgatgcg 300  
gacattgccg ccgtcgccac ttatatcatg aacgccttg acaacggcgg cggaagcggt 360  
accgaaaaag acgtaaaaaca ggcaaaaagc aaaaaaaaaact aa 402

<210> 46  
<211> 133  
<212> PRT  
<213> Neisseria meningitidis

<400> 46  
Met Asn Thr Thr Arg Leu Pro Thr Ala Leu Val Leu Gly Cys Phe Cys  
1 5 10 15  
  
Ala Ala Ala Ser Ala Ala Asp Asn Ser Ile Met Thr Lys Gly Gln Lys  
20 25 30  
  
Val Tyr Glu Ser Asn Cys Val Ala Cys His Gly Lys Lys Gly Glu Gly  
35 40 45  
  
Arg Gly Thr Met Phe Pro Pro Leu Tyr Arg Ser Asp Phe Ile Met Lys  
50 55 60  
  
Lys Pro Gln Val Leu Leu His Ser Met Val Lys Gly Ile Asn Gly Thr  
65 70 75 80  
  
Ile Lys Val Asn Gly Lys Thr Tyr Asn Gly Phe Met Pro Ala Thr Ala  
85 90 95  
  
Ile Ser Asp Ala Asp Ile Ala Ala Val Ala Thr Tyr Ile Met Asn Ala  
100 105 110  
  
Phe Asp Asn Gly Gly Ser Val Thr Glu Lys Asp Val Lys Gln Ala  
115 120 125  
  
Lys Ser Lys Lys Asn  
130

<210> 47

<211> 396  
<212> DNA  
<213> Neisseria meningitidis

<400> 47  
atgaacacaa cccgactgcc gaccgcctc gtcttggct gcctctgcgc cgccgcttct 60  
gccgcgaca acagcatcat gacaaaaggg caaaaagtgt acgaatccaa ctgcgtcgcc 120  
tgccacggca aaaaggcgaa aggccgcgga accatgttc cgccgctcta ccgcgtccgac 180  
ttcatcatga aaaaaccgca ggtgctgctg cacagcatgg tcaaaggcat caacggtaca 240  
atcaaagtca acggcaaaac ctacaacggta ttcatgcccgc caactgccc catcgatgctg 300  
gacattgcccggc ccgtcgccac ttatatcatg aacgccttg acaacggcgg cggaagcggt 360  
accgaaaaag acgtaaaaaca ggcaaaaaaac aaaaaaa 396

<210> 48  
<211> 132  
<212> PRT  
<213> Neisseria meningitidis

<400> 48  
Met Asn Thr Thr Arg Leu Pro Thr Ala Leu Val Leu Gly Cys Leu Cys  
1 5 10 15

Ala Ala Ala Ser Ala Ala Asp Asn Ser Ile Met Thr Lys Gly Gln Lys  
20 25 30

Val Tyr Glu Ser Asn Cys Val Ala Cys His Gly Lys Lys Gly Glu Gly  
35 40 45

Arg Gly Thr Met Phe Pro Pro Leu Tyr Arg Ser Asp Phe Ile Met Lys  
50 55 60

Lys Pro Gln Val Leu Leu His Ser Met Val Lys Gly Ile Asn Gly Thr  
65 70 75 80

Ile Lys Val Asn Gly Lys Thr Tyr Asn Gly Phe Met Pro Ala Thr Ala  
85 90 95

Ile Ser Asp Ala Asp Ile Ala Ala Val Ala Thr Tyr Ile Met Asn Ala  
100 105 110

Phe Asp Asn Gly Gly Ser Val Thr Glu Lys Asp Val Lys Gln Ala  
115 120 125

Lys Asn Lys Lys  
130

<210> 49  
<211> 495  
<212> DNA  
<213> Neisseria gonorrhoeae

<400> 49  
atgaacaaca gacattttgc cgtcatcgcc ttgggcagca accttgacaa ccccgacaa 60  
caaatacgcg ggcgcattaga cgcgcgtctcg tccccatcctg acatccggct tgaacagggt 120  
tcctcactgt atatgaccgc acctgtcggt tacgacaatc agcccgattt catcaatgcc 180

gtctgcaccc tttccaccac cttggacggc attgccctgc ttgccgaact caaccgtatc 240  
gaagccgatt tcggacgcga acgcagttc cgcaatgcac cgccacatt ggatttggac 300  
attatcgact ttgacggcat ctccagcgac gaccccccgc ttaccctgcc gcacatccgcgc 360  
gcccacgaac gcagttcgt catacgccct ttggcagaaa tcctccctga ttttatttg 420  
ggaaaatacg gaaagggtgt cgaattgtca aaacggctgg gcaatcaagg catccgtctt 480  
ttaccggaca ggtaa 495

<210> 50

<211> 164

<212> PRT

<213> Neisseria gonorrhoeae

<400> 50

Met Asn Asn Arg His Phe Ala Val Ile Ala Leu Gly Ser Asn Leu Asp  
1 5 10 15

Asn Pro Ala Gln Gln Ile Arg Gly Ala Leu Asp Ala Leu Ser Ser His  
20 25 30

Pro Asp Ile Arg Leu Glu Gln Val Ser Ser Leu Tyr Met Thr Ala Pro  
35 40 45

Val Gly Tyr Asp Asn Gln Pro Asp Phe Ile Asn Ala Val Cys Thr Val  
50 55 60

Ser Thr Thr Leu Asp Gly Ile Ala Leu Leu Ala Glu Leu Asn Arg Ile  
65 70 75 80

Glu Ala Asp Phe Gly Arg Glu Arg Ser Phe Arg Asn Ala Pro Arg Thr  
85 90 95

Leu Asp Leu Asp Ile Ile Asp Phe Asp Gly Ile Ser Ser Asp Asp Pro  
100 105 110

Arg Leu Thr Leu Pro His Pro Arg Ala His Glu Arg Ser Phe Val Ile  
115 120 125

Arg Pro Leu Ala Glu Ile Leu Pro Asp Phe Ile Leu Gly Lys Tyr Gly  
130 135 140

Lys Val Val Glu Leu Ser Lys Arg Leu Gly Asn Gln Gly Ile Arg Leu  
145 150 155 160

Leu Pro Asp Arg

<210> 51

<211> 497

<212> DNA

<213> Neisseria meningitidis

<400> 51

atgaacaaca gacattttgc cgtcatcgcc ctgggcagta atcttggaaaa ccctgctcaa 60  
caggtacgcg ccgcattgga cacgctgtcg tccccatcctg acatccgtct taaacaggct 120  
tcctcactgt atatgaccgc gcccgtcggt tacgacaatc agccccgattt tgtcaatgcc 180

gtctgcaccg tttccaccac tctggacggc attgccytgc ttgccgaact caaccgtatc 240  
gaggctgatt tcggacgcga acccagcttc cgcaacgcgc cgccacatt gkatttggac 300  
attatcgact ttgacggcat ctccagcgac gacacscgac tcaccttgcg gcatccgcgc 360  
gcccacgaaac gcaatttcgt catccgcct ttggcagaaa tcctccctga ttttgttta 420  
gaaaaacacg gaaagggtgc cgaattgtca aaacggytgg gcaatcaagg tatccgtctt 480  
ttacccgaca ggttaatt 497

<210> 52  
<211> 164  
<212> PRT  
<213> Neisseria meningitidis

<220>  
<221> UNSURE  
<222> (98)  
<223> Xaa is any amino acid

<400> 52  
Met Asn Asn Arg His Phe Ala Val Ile Ala Leu Gly Ser Asn Leu Glu  
1 5 10 15

Asn Pro Ala Gln Gln Val Arg Ala Ala Leu Asp Thr Leu Ser Ser His  
20 25 30

Pro Asp Ile Arg Leu Lys Gln Ala Ser Ser Leu Tyr Met Thr Ala Pro  
35 40 45

Val Gly Tyr Asp Asn Gln Pro Asp Phe Val Asn Ala Val Cys Thr Val  
50 55 60

Ser Thr Thr Leu Asp Gly Ile Ala Leu Leu Ala Glu Leu Asn Arg Ile  
65 70 75 80

Glu Ala Asp Phe Gly Arg Glu Arg Ser Phe Arg Asn Ala Pro Arg Thr  
85 90 95

Leu Xaa Leu Asp Ile Ile Asp Phe Asp Gly Ile Ser Ser Asp Asp Thr  
100 105 110

Arg Leu Thr Leu Pro His Pro Arg Ala His Glu Arg Ser Phe Val Ile  
115 120 125

Arg Pro Leu Ala Glu Ile Leu Pro Asp Phe Val Leu Gly Lys His Gly  
130 135 140

Lys Val Ala Glu Leu Ser Lys Arg Leu Gly Asn Gln Gly Ile Arg Leu  
145 150 155 160

Leu Pro Asp Arg

<210> 53  
<211> 495  
<212> DNA  
<213> Neisseria meningitidis

<400> 53  
atgaacaaca gacattttgc cgtcatcgcc ctgggcagta atcttggaaaa ccctgccccaa 60  
caggtacgcg ccgcatttggc cacgctgtcg tcccatttcgt acatccgtct taaacaggct 120  
tccttcactgt atatgaccgcg gcccgctcggt tacgacaatc agcccgattt cgtcaatgcc 180  
gtctgcaccg ttccaccac cttggacggc attgcctgc ttggcgaact caaccgtatc 240  
gaagccgatt tcggacgcga acccagcttc cgcaacgcgc cgccacatt ggatttggac 300  
attatcgact ttgacggcat ctccagcgcac gaccccgac tcaccctgcc gcacccgcgc 360  
gcccacgaac gcagttcgt catacccctt ttggcagaaa tcctccctga ttttattttg 420  
ggaaaaacacg gaaagggttgc cgaattgtca aaacggctgg gcaatcaagg catccgtctt 480  
ttaccggata agtaa 495

<210> 54  
<211> 164  
<212> PRT  
<213> Neisseria meningitidis

<400> 54  
Met Asn Asn Arg His Phe Ala Val Ile Ala Leu Gly Ser Asn Leu Glu  
1 5 10 15  
  
Asn Pro Ala Gln Gln Val Arg Ala Ala Leu Asp Thr Leu Ser Ser His  
20 25 30  
  
Pro Asp Ile Arg Leu Lys Gln Ala Ser Ser Leu Tyr Met Thr Ala Pro  
35 40 45  
  
Val Gly Tyr Asp Asn Gln Pro Asp Phe Val Asn Ala Val Cys Thr Val  
50 55 60  
  
Ser Thr Thr Leu Asp Gly Ile Ala Leu Leu Ala Glu Leu Asn Arg Ile  
65 70 75 80  
  
Glu Ala Asp Phe Gly Arg Glu Arg Ser Phe Arg Asn Ala Pro Arg Thr  
85 90 95  
  
Leu Asp Leu Asp Ile Ile Asp Phe Asp Gly Ile Ser Ser Asp Asp Pro  
100 105 110  
  
Arg Leu Thr Leu Pro His Pro Arg Ala His Glu Arg Ser Phe Val Ile  
115 120 125  
  
Arg Pro Leu Ala Glu Ile Leu Pro Asp Phe Ile Leu Gly Lys His Gly  
130 135 140  
  
Lys Val Ala Glu Leu Ser Lys Arg Leu Gly Asn Gln Gly Ile Arg Leu  
145 150 155 160  
  
Leu Pro Asp Lys

<210> 55  
<211> 261  
<212> DNA  
<213> Neisseria gonorrhoeae

<400> 55

atgccccgcg ctgccgtgc cttttagcgt catcatcaca aaagcaaagc cgaacaaaat 60  
accatcgcc gcccgcacgc agagatagcc gaaggcttcg cggttgaaa tcagcacacg 120  
caggcgcgaa accagtccgt aatggcggtc cagctgccgc tcgtcgccct ttcggataaa 180  
gtggttgtcg cggtccaagc tggtgttcag gcggaaatac aggtttcgc tcatggcg 240  
aaaacgtggc aaaagccata a 261

<210> 56

<211> 86

<212> PRT

<213> Neisseria gonorrhoeae

<400> 56

Met Pro Arg Ala Ala Val Ala Phe Glu Arg His His His Lys Ser Lys  
1 5 10 15

Ala Glu Gln Asn Thr His Arg Arg Ala Asp Ala Glu Ile Ala Glu Gly  
20 25 30

Phe Ala Val Gly Asn Gln His Thr Gln Ala Arg Asn Gln Ser Val Met  
35 40 45

Ala Val Gln Leu Pro Leu Val Ala Phe Ser Asp Lys Val Val Val Ala  
50 55 60

Phe Gln Ala Val Val Gln Ala Glu Ile Gln Val Phe Ala Asp Gly Gly  
65 70 75 80

Lys Thr Trp Gln Lys Pro  
85

<210> 57

<211> 261

<212> DNA

<213> Neisseria meningitidis

<400> 57

atgccccgcg ctgctgtgc cttttagcgt catcatcaca aaagcaaagc cgaacaaaat 60  
accatcgcc gtgccgcacgc agagatagcc gaaggcttcg cggttgaaa tcagcacacg 120  
caggcgcgca agcagtccgt aatggcggtc cagctgccgc cggtcgccct ttcggataaa 180  
gtggttgtcg cggtccaagc tggtgttcag gcggaaatac aggtttcgc tcatggcg 240  
aaaacgtggc aaaagccata a 261

<210> 58

<211> 86

<212> PRT

<213> Neisseria meningitidis

<400> 58

Met Pro Arg Ala Ala Val Ala Phe Glu Arg His His His Lys Ser Lys  
1 5 10 15

Ala Glu Gln Asn Thr His Arg Arg Ala Asp Ala Glu Ile Ala Glu Gly

20

25

30

Phe Ala Val Gly Asn Gln His Thr Gln Ala Arg Lys Gln Ser Val Met  
35 . . . . . 40 . . . . . 45

Ala Val Gln Leu Pro Pro Val Ala Phe Ser Asp Lys Val Val Val Ala  
50 . . . . . 55 . . . . . 60

Phe Gln Ala Val Val Gln Ala Glu Ile Gln Val Phe Ala Asp Gly Gly  
65 . . . . . 70 . . . . . 75 . . . . . 80

Lys Thr Trp Gln Lys Pro  
85

<210> 59

<211> 261

<212> DNA

<213> Neisseria meningitidis

<400> 59

atgccccgcg ctgctgttagc ctttgagcgt catcatcaca aaagcaaagc cgaacaaaat 60  
accatcgcc gtgccgacgc agagatagcc gaaggcttcg cggttggaaa tcagcacacg 120  
caggcgcgca agcagtccgt aatggcggtc cagctgccgc tcgtcgccctt ttccggataaa 180  
gtggttgtcg cgttccaagc tgttcttcag gcggaaatac aggtttcgc tcatggcgcc 240  
aaaacgtggc aaaagccata a 261

<210> 60

<211> 86

<212> PRT

<213> Neisseria meningitidis

<400> 60

Met Pro Arg Ala Ala Val Ala Phe Glu Arg His His His Lys Ser Lys  
1 . . . . . 5 . . . . . 10 . . . . . 15

Ala Glu Gln Asn Thr His Arg Arg Ala Asp Ala Glu Ile Ala Glu Gly  
20 . . . . . 25 . . . . . 30

Phe Ala Val Gly Asn Gln His Thr Gln Ala Arg Lys Gln Ser Val Met  
35 . . . . . 40 . . . . . 45

Ala Val Gln Leu Pro Leu Val Ala Phe Ser Asp Lys Val Val Val Ala  
50 . . . . . 55 . . . . . 60

Phe Gln Ala Val Leu Gln Ala Glu Ile Gln Val Phe Ala Asp Gly Gly  
65 . . . . . 70 . . . . . 75 . . . . . 80

Lys Thr Trp Gln Lys Pro  
85

<210> 61

<211> 1248

<212> DNA

<213> Neisseria gonorrhoeae

<400> 61

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ccgaccggct cgccataccgt agccggcgcag ggccgttattt ccgcctctct gggtaatgtg 180  
caggaggacc gttgggactg gcacatgtac gataccgtga aagggtccga ctggctggc 240  
gaccaagatg cgattgagtt tatgtgtcgc gctgcgcctg aagcggtgat tgagttggaa 300  
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ggacatactg ccgaacatgg taaacgtcg gtagaacgtg catgtgcgtg tgccgaccgt 420  
accggcatcg cgatgttgc tactttgtac caacaaaacg tccgtgccaa tacacaattc 480  
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<210> 62

<211> 415

<212> PRT

<213> Neisseria gonorrhoeae

<400> 62

Met Gly Phe Pro Val Arg Lys Phe Asp Ala Val Ile Val Gly Gly Gly  
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Gly Ala Gly Leu Arg Ala Ala Leu Gln Leu Ser Lys Ser Gly Leu Asn  
20 25 30

Cys Ala Val Leu Ser Lys Val Phe Pro Thr Arg Ser His Thr Val Ala  
35 40 45

Ala Gln Gly Gly Ile Ser Ala Ser Leu Gly Asn Val Gln Glu Asp Arg  
50 55 60

Trp Asp Trp His Met Tyr Asp Thr Val Lys Gly Ser Asp Trp Leu Gly  
65 70 75 80

Asp Gln Asp Ala Ile Glu Phe Met Cys Arg Ala Ala Pro Glu Ala Val  
85 90 95

Ile Glu Leu Glu His Met Gly Met Pro Phe Asp Arg Val Glu Ser Gly  
100 105 110

Lys Ile Tyr Gln Arg Pro Phe Gly Gly His Thr Ala Glu His Gly Lys  
115 120 125

Arg Ala Val Glu Arg Ala Cys Ala Val Ala Asp Arg Thr Gly His Ala  
130 135 140

Met Leu His Thr Leu Tyr Gln Gln Asn Val Arg Ala Asn Thr Gln Phe  
 145 150 155 160

Phe Val Glu Trp Thr Ala Gln Asp Leu Ile Arg Asp Glu Asn Gly Asp  
 165 170 175

Val Val Gly Val Thr Ala Met Glu Met Glu Thr Gly Glu Val Tyr Ile  
 180 185 190

Phe His Ala Lys Ala Val Met Phe Ala Thr Gly Gly Gly Arg Ile  
 195 200 205

Tyr Ala Ser Ser Thr Asn Ala Tyr Met Asn Thr Gly Asp Gly Leu Gly  
 210 215 220

Ile Cys Ala Arg Ala Gly Ile Pro Leu Glu Asp Met Glu Phe Trp Gln  
 225 230 235 240

Phe His Pro Thr Gly Val Ala Gly Ala Gly Val Leu Ile Thr Glu Gly  
 245 250 255

Val Arg Gly Glu Gly Gly Ile Leu Leu Asn Ala Asp Gly Glu Arg Phe  
 260 265 270

Met Glu Arg Tyr Ala Pro Thr Val Lys Asp Leu Ala Ser Arg Asp Val  
 275 280 285

Val Ser Arg Ala Met Ala Met Glu Ile Tyr Glu Gly Arg Gly Cys Gly  
 290 295 300

Lys Asn Lys Asp His Val Leu Leu Lys Ile Asp His Ile Gly Ala Glu  
 305 310 315 320

Lys Ile Met Glu Lys Leu Pro Gly Ile Arg Glu Ile Ser Ile Gln Phe  
 325 330 335

Ala Gly Ile Asp Pro Ile Lys Asp Pro Ile Pro Val Val Pro Thr Thr  
 340 345 350

His Tyr Met Met Gly Gly Ile Pro Thr Asn Tyr His Gly Glu Val Val  
 355 360 365

Val Pro Gln Gly Asp Glu Tyr Glu Val Pro Val Lys Gly Leu Tyr Ala  
 370 375 380

Ala Gly Glu Cys Ala Cys Ala Ser Val His Gly Ala Asn Arg Leu Gly  
 385 390 395 400

Thr Asn Ser Leu Leu Asp Leu Val Val Phe Arg Pro Thr Pro Arg  
 405 410 415

<210> 63

<211> 696

<212> DNA

<213> Neisseria meningitidis

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 <222> (1)  
 <223> N is any nucleotide

<220>  
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 <222> (100)  
 <223> N is any nucleotide

<400> 63  
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 cggtggact ggcacatgtt cgtaccgtt aaaggttccg actgggttggg cgaccaagat 180  
 gcgattgagt ttatgtgccg cgccgcgcct gaagccgtaa ttgagtttggaa acacatgggt 240  
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 gccgaacacg gttaaacgcgc ggtagaacgc gyctgtgcgg ttgcccaccc tacaggtcat 360  
 gcgatgctgc atactttgtt ccaacaaaac gtccgtgcaca atacgcaatt ctgttgaa 420  
 tggacggcac aagatttgat tcgtgtatgaa aacggcgatg tcgtcgccgt aaccgcgt 480  
 gaaatggaaa ccggcgaagt ttatatttc cacgctaaag ctgtgtatgtt tgctaccggc 540  
 ggcggcggcgtc gtatttatgc gtcttctacc aatgcctata tgaataccgg cgatggtttgc 600  
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 accggcgtgg cgggtgcggg cgtgttgatt accgaa 696

<210> 64  
 <211> 234  
 <212> PRT  
 <213> Neisseria meningitidis

<220>  
 <221> UNSURE  
 <222> (1)  
 <223> Xaa is any amino acid

<220>  
 <221> UNSURE  
 <222> (34)  
 <223> Xaa is any amino acid

<220>  
 <221> UNSURE  
 <222> (112)  
 <223> Xaa is any amino acid

<400> 64  
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Phe Pro Thr Arg Ser His Thr Val Ala Ala Gln Gly Gly Ile Ser Ala  
 20 25 30

Ser Xaa Gly Asn Val Gln Glu Asp Arg Trp Asp Trp His Met Tyr Asp  
 35 40 45

Thr Val Lys Gly Ser Asp Trp Leu Gly Asp Gln Asp Ala Ile Glu Phe

50	55	60
Met Cys Arg Ala Ala Pro Glu Ala Val Ile Glu Leu Glu His Met Gly		
65	70	75
Met Pro Phe Asp Arg Val Glu Ser Gly Lys Ile Tyr Gln Arg Pro Phe		
85	90	95
Cys Ala Val Ala Asp Arg Thr Gly His Ala Met Leu His Thr Leu Tyr		
100	105	110
Gln Gln Asn Val Arg Ala Asn Thr Gln Phe Phe Val Glu Trp Thr Ala		
115	120	125
Gln Asp Leu Ile Arg Asp Glu Asn Gly Asp Val Val Gly Val Thr Ala		
130	135	140
Met Glu Met Glu Thr Gly Glu Val Tyr Ile Phe His Ala Lys Ala Val		
145	150	155
Met Phe Ala Thr Gly Gly Gly Arg Ile Tyr Ala Ser Ser Thr Asn		
165	170	175
Gly Ile Pro Leu Glu Asp Met Glu Phe Trp Gln Phe Gln Pro Thr Gly		
180	185	190
Val Ala Gly Ala Gly Val Leu Ile Thr Glu		
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<211> 1764  
<212> DNA  
<213> Neisseria meningitidis

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<222> (67)  
<223> N is any nucleotide

<220>  
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<223> N is any nucleotide

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acaggtcatg ccatgctgca tactttgtac caacaaaatg tccgtgccaa tacgcaattc 480  
tttgtgaaat ggacggcaca agatttgatt cgtgatgaaa acggcgatgt cgtcggcgta 540  
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gctaccggcg gggcggccg tatttatgcg ttttacca atgcctatat gaataccggc 660  
gatggtttg gtatttgtgc gcgtgcaggat atcccgttgg aagacatgaa attctggca 720  
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cgccgctgcg gtaaaaacaa agaccatgtc ttactgaaaa tcgaccatata cgccgcagaa 960  
aaaattatgg aaaaactgcc gggcatccgc gagatttcca ttcaagtgcg cggtatcgat 1020  
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gaactgcaac gctccgtaca attgcacgcc ggcgttcc gtactgatga gattctgagc 1440  
aaaggcgttc gagaagtcat ggcgttgcg gacgtgtga aacgtaccga aatcaaagac 1500  
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gtggcggaaag cgacttttgt gtctgccc gacgtaaag aatcacgcgg tgccacgct 1620  
tcagacgacc atcctgagcg cgatgtatga aactggatga aacatacgt gtaccattca 1680

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aaaccggcca agcgcgttta ttga 1764

<210> 66  
<211> 587  
<212> PRT  
<213> Neisseria meningitidis

<220>  
<221> UNSURE  
<222> (23)  
<223> Xaa is any amino acid

<400> 66  
Met Gly Phe Pro Val Arg Lys Phe Asp Ala Val Ile Val Gly Gly Gly  
1 5 10 15

Gly Ala Gly Leu Arg Ala Xaa Leu Gln Leu Ser Lys Ser Gly Leu Asn  
20 25 30

Cys Ala Val Leu Ser Lys Val Phe Pro Thr Arg Ser His Thr Val Ala  
35 40 45

Ala Gln Gly Gly Ile Ser Ala Ser Leu Gly Asn Val Gln Glu Asp Arg  
50 55 60

Trp Asp Trp His Met Tyr Asp Thr Val Lys Gly Ser Asp Trp Leu Gly  
65 70 75 80

Asp Gln Asp Ala Ile Glu Phe Met Cys Arg Ala Ala Pro Glu Ala Val  
85 90 95

Ile Glu Leu Glu His Met Gly Met Pro Phe Asp Arg Val Glu Ser Gly  
100 105 110

Lys Ile Tyr Gln Arg Pro Phe Gly Gly His Thr Ala Glu His Gly Lys  
115 120 125

Arg Ala Val Glu Arg Ala Cys Ala Val Ala Asp Arg Thr Gly His Ala  
130 135 140

Met Leu His Thr Leu Tyr Gln Gln Asn Val Arg Ala Asn Thr Gln Phe  
145 150 155 160

Phe Val Glu Trp Thr Ala Gln Asp Leu Ile Arg Asp Glu Asn Gly Asp  
165 170 175

Val Val Gly Val Thr Ala Met Glu Met Glu Thr Gly Glu Val Tyr Ile  
180 185 190

Phe His Ala Lys Ala Val Met Phe Ala Thr Gly Gly Gly Arg Ile  
195 200 205

Tyr Ala Ser Ser Thr Asn Ala Tyr Met Asn Thr Gly Asp Gly Leu Gly  
210 215 220

Ile Cys Ala Arg Ala Gly Ile Pro Leu Glu Asp Met Glu Phe Trp Gln  
225 230 235 240

Phe His Pro Thr Gly Val Ala Gly Val Leu Ile Thr Glu Gly  
245 250 255

Val Arg Gly Glu Gly Gly Ile Leu Leu Asn Ala Asp Gly Glu Arg Phe  
260 265 270

Met Glu Arg Tyr Ala Pro Thr Val Lys Asp Leu Ala Ser Arg Asp Val  
275 280 285

Val Ser Arg Ala Met Ala Met Glu Ile Tyr Glu Gly Arg Gly Cys Gly  
290 295 300

Lys Asn Lys Asp His Val Leu Leu Lys Ile Asp His Ile Gly Ala Glu  
305 310 315 320

Lys Ile Met Glu Lys Leu Pro Gly Ile Arg Glu Ile Ser Ile Gln Phe  
325 330 335

Ala Gly Ile Asp Pro Ile Lys Asp Pro Ile Pro Val Val Pro Thr Thr  
340 345 350

His Tyr Met Met Gly Gly Ile Pro Thr Asn Tyr His Gly Glu Val Val  
355 360 365

Val Pro Gln Gly Asp Glu Tyr Glu Val Pro Val Lys Gly Leu Tyr Ala  
370 375 380

Ala Gly Glu Cys Ala Cys Ala Ser Val His Gly Ala Asn Arg Leu Gly  
385 390 395 400

Thr Asn Ser Leu Leu Asp Leu Val Val Phe Gly Lys Ala Ala Gly Asp  
405 410 415

Ser Met Ile Lys Phe Ile Lys Glu Gln Ser Asp Trp Lys Pro Leu Pro  
420 425 430

Ala Asn Ala Gly Glu Leu Thr Arg Gln Arg Ile Glu Arg Leu Asp Asn  
435 440 445

Gln Thr Asp Gly Glu Asn Val Asp Ala Leu Arg Arg Glu Leu Gln Arg  
450 455 460

Ser Val Gln Leu His Ala Gly Val Phe Arg Thr Asp Glu Ile Leu Ser  
465 470 475 480

Lys Gly Val Arg Glu Val Met Ala Ile Ala Glu Arg Val Lys Arg Thr  
485 490 495

Glu Ile Lys Asp Lys Ser Lys Val Trp Asn Thr Ala Arg Ile Glu Ala  
500 505 510

Leu Glu Leu Asp Asn Leu Ile Glu Val Ala Lys Ala Thr Leu Val Ser  
515 520 525

Ala Glu Ala Arg Lys Glu Ser Arg Gly Ala His Ala Ser Asp Asp His  
530 535 540

Pro Glu Arg Asp Asp Glu Asn Trp Met Lys His Thr Leu Tyr His Ser  
545 550 555 560

Asp Ala Asn Thr Leu Ser Tyr Lys Pro Val His Thr Lys Pro Leu Ser  
565 570 575

Val Glu Tyr Ile Lys Pro Ala Lys Arg Val Tyr  
580 585

<210> 67

<211> 1248

<212> DNA

<213> Neisseria gonorrhoeae

<400> 67

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caggaggacc gttggactg gcacatgtac gataccgtga aaggttccga ctggctggc 240  
gaccaagatg cgatttagtt tatgtgtcgc gctgcgcctg aagcggtat tgagttggaa 300  
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ggctgtatg ccgcaggtga gtgcgcctgt gcttcgtac acggtgcaa ccgttgggt 1200  
acgaactccc tgctggactt ggtgggtttc cgcccaaccc cccggta 1248

<210> 68

<211> 415

<212> PRT

<213> Neisseria gonorrhoeae

<400> 68

Met Gly Phe Pro Val Arg Lys Phe Asp Ala Val Ile Val Gly Gly Gly  
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Gly Ala Gly Leu Arg Ala Ala Leu Gln Leu Ser Lys Ser Gly Leu Asn  
20 25 30

Cys Ala Val Leu Ser Lys Val Phe Pro Thr Arg Ser His Thr Val Ala  
35 40 45

Ala Gln Gly Gly Ile Ser Ala Ser Leu Gly Asn Val Gln Glu Asp Arg  
50 55 60

Trp Asp Trp His Met Tyr Asp Thr Val Lys Gly Ser Asp Trp Leu Gly  
65 70 75 80

Asp Gln Asp Ala Ile Glu Phe Met Cys Arg Ala Ala Pro Glu Ala Val  
85 90 95

Ile Glu Leu Glu His Met Gly Met Pro Phe Asp Arg Val Glu Ser Gly  
100 105 110

Lys Ile Tyr Gln Arg Pro Phe Gly Gly His Thr Ala Glu His Gly Lys  
115 120 125

Arg Ala Val Glu Arg Ala Cys Ala Val Ala Asp Arg Thr Gly His Ala  
130 135 140

Met Leu His Thr Leu Tyr Gln Gln Asn Val Arg Ala Asn Thr Gln Phe  
145 150 155 160

Phe Val Glu Trp Thr Ala Gln Asp Leu Ile Arg Asp Glu Asn Gly Asp  
165 170 175

Val Val Gly Val Thr Ala Met Glu Met Glu Thr Gly Glu Val Tyr Ile  
180 185 190

Phe His Ala Lys Ala Val Met Phe Ala Thr Gly Gly Gly Arg Ile  
195 200 205

Tyr Ala Ser Ser Thr Asn Ala Tyr Met Asn Thr Gly Asp Gly Leu Gly  
210 215 220

Ile Cys Ala Arg Ala Gly Ile Pro Leu Glu Asp Met Glu Phe Trp Gln  
225 230 235 240

Phe His Pro Thr Gly Val Ala Gly Ala Gly Val Leu Ile Thr Glu Gly  
245 250 255

Val Arg Gly Glu Gly Gly Ile Leu Leu Asn Ala Asp Gly Glu Arg Phe  
260 265 270

Met Glu Arg Tyr Ala Pro Thr Val Lys Asp Leu Ala Ser Arg Asp Val  
275 280 285

Val Ser Arg Ala Met Ala Met Glu Ile Tyr Glu Gly Arg Gly Cys Gly  
290 295 300

Lys Asn Lys Asp His Val Leu Leu Lys Ile Asp His Ile Gly Ala Glu  
305 310 315 320

Lys Ile Met Glu Lys Leu Pro Gly Ile Arg Glu Ile Ser Ile Gln Phe  
325 330 335

Ala Gly Ile Asp Pro Ile Lys Asp Pro Ile Pro Val Val Pro Thr Thr  
340 345 350

His Tyr Met Met Gly Gly Ile Pro Thr Asn Tyr His Gly Glu Val Val  
355 360 365

Val Pro Gln Gly Asp Glu Tyr Glu Val Pro Val Lys Gly Leu Tyr Ala  
370 375 380

Ala Gly Glu Cys Ala Cys Ala Ser Val His Gly Ala Asn Arg Leu Gly  
385 390 395 400

Thr Asn Ser Leu Leu Asp Leu Val Val Phe Arg Pro Thr Pro Arg  
405 410 415

<210> 69

<211> 1767

<212> DNA

<213> Neisseria meningitidis

<400> 69

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ccgaccgggt cgcataccgt agcggcgca ggcggattt ccgcctctct ggtaatgtg 180  
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accaattacc acggcgaagt tgcgttccg caaggtgaag attacgaagt gcctgtaaaa 1140

ggctctgtatg cggcaggtga gtgcgttgc acgggtgcgaa ccgcgtgggt 1200  
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<210> 70  
<211> 587  
<212> PRT  
<213> Neisseria meningitidis

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Cys Ala Val Leu Ser Lys Val Phe Pro Thr Arg Ser His Thr Val Ala  
35 40 45  
  
Ala Gln Gly Gly Ile Ser Ala Ser Leu Gly Asn Val Gln Glu Asp Arg  
50 55 60  
  
Trp Asp Trp His Met Tyr Asp Thr Val Lys Gly Ser Asp Trp Leu Gly  
65 70 75 80  
  
Asp Gln Asp Ala Ile Glu Phe Met Cys Arg Ala Ala Pro Glu Ala Val  
85 90 95  
  
Ile Glu Leu Glu His Met Gly Met Pro Phe Asp Arg Val Glu Ser Gly  
100 105 110  
  
Lys Ile Tyr Gln Arg Pro Phe Gly Gly His Thr Ala Glu His Gly Lys  
115 120 125  
  
Arg Ala Val Glu Arg Ala Cys Ala Val Ala Asp Arg Thr Gly His Ala  
130 135 140  
  
Met Leu His Thr Leu Tyr Gln Gln Asn Val Arg Ala Asn Thr Gln Phe  
145 150 155 160  
  
Phe Val Glu Trp Thr Ala Gln Asp Leu Ile Arg Asp Glu Asn Gly Asp  
165 170 175  
  
Val Val Gly Val Thr Ala Met Glu Met Glu Thr Gly Glu Val Tyr Ile  
180 185 190  
  
Phe His Ala Lys Ala Val Met Phe Ala Thr Gly Gly Gly Arg Ile

195                    200                    205  
Tyr Ala Ser Ser Thr Asn Ala Tyr Met Asn Thr Gly Asp Gly Leu Gly  
210                    215                    220  
  
Ile Cys Ala Arg Ala Gly Ile Pro Leu Glu Asp Met Glu Phe Trp Gln  
225                    230                    235                    240  
  
Phe His Pro Thr Gly Val Ala Gly Ala Gly Val Leu Ile Thr Glu Gly  
245                    250                    255  
  
Val Arg Gly Glu Gly Gly Ile Leu Leu Asn Ala Asp Gly Glu Arg Phe  
260                    265                    270  
  
Met Glu Arg Tyr Ala Pro Thr Val Lys Asp Leu Ala Ser Arg Asp Val  
275                    280                    285  
  
Val Ser Arg Ala Met Ala Met Glu Ile Tyr Glu Gly Arg Gly Cys Gly  
290                    295                    300  
  
Lys Asn Lys Asp His Val Leu Leu Lys Ile Asp His Ile Gly Ala Glu  
305                    310                    315                    320  
  
Lys Ile Met Glu Lys Leu Pro Gly Ile Arg Glu Ile Ser Ile Gln Phe  
325                    330                    335  
  
Ala Gly Ile Asp Pro Ile Lys Asp Pro Ile Pro Val Val Pro Thr Thr  
340                    345                    350  
  
His Tyr Met Met Gly Gly Ile Pro Thr Asn Tyr His Gly Glu Val Val  
355                    360                    365  
  
Val Pro Gln Gly Glu Asp Tyr Glu Val Pro Val Lys Gly Leu Tyr Ala  
370                    375                    380  
  
Ala Gly Glu Cys Ala Cys Ala Ser Val His Gly Ala Asn Arg Leu Gly  
385                    390                    395                    400  
  
Thr Asn Ser Leu Leu Asp Leu Val Val Phe Gly Lys Ala Ala Gly Asp  
405                    410                    415  
  
Ser Met Ile Lys Phe Ile Lys Glu Gln Ser Asp Trp Lys Pro Leu Pro  
420                    425                    430  
  
Ala Asn Ala Gly Glu Leu Thr Arg Gln Arg Ile Glu Arg Leu Asp Asn  
435                    440                    445  
  
Gln Thr Asp Gly Glu Asn Val Asp Ala Leu Arg Arg Glu Leu Gln Arg  
450                    455                    460  
  
Ser Val Gln Leu His Ala Gly Val Phe Arg Thr Asp Glu Ile Leu Ser  
465                    470                    475                    480  
  
Lys Gly Val Arg Glu Val Met Ala Ile Ala Glu Arg Val Lys Arg Thr  
485                    490                    495  
  
Glu Ile Lys Asp Lys Ser Lys Val Trp Asn Thr Ala Arg Ile Glu Ala